CLAIMS

1. Polynucleotide vaccine formula intended for bovines, comprising an intradermally effective quantity of a plasmid combining a DNA sequence encoding an immunogen of a bovine pathogenic agent and a promoter allowing the expression of this immunogen in vivo in the cells of the skin, this vaccine formula being suitable for intradermal administration with an apparatus for liquid jet administration.

2. Vaccine formula according to Claim 1, characterized in that the plasmid is presented in a vehicle suitable for the intradermal route in a dose volume of between 0.1 and 0.9 ml, preferably between 0.2 and 0.6 ml, still more preferably 0.4 and 0.5 ml, capable of being administered intradermally by liquid jet.

3. Vaccine formula according to Claim 1 or 2, characterized in that the plasmid is present in the vaccine formula in an intradermally effective quantity of 10 ng to 1 mg, preferably of 100 ng to 500 µg, more preferably of 0.5 µg to 50 µg.

4. Vaccine formula according to Claim 3, characterized in that the DNA sequence encodes an immunogen of a pathogenic agent chosen from the group consisting of BRSV virus, IBR virus, BVD virus and PI 3 virus.

5. Vaccine formula according to Claim 4, characterized in that the DNA sequence encodes the IBR virus gB gene and/or gD gene.

6. Vaccine formula according to Claim 4, characterized in that the DNA sequence encodes the BRSV G and/or F gene.

7. Vaccine formula according to Claim 4, characterized in that the DNA sequence encodes E2 and/or E1 from the BVD virus.

8. Vaccine formula according to Claim 4, characterized in that the DNA sequence encodes HN and/or F from the PI 3 virus.

9. Vaccine formula according to any one of Claims 1 to 8, characterized in that the promoter is a strong eukaryotic promoter, such as the hCMV IE promoter.

10. Vaccine formula according to any one of Claims 1 to 9, characterized in that it is packaged in a multidose vial fitted to an apparatus for liquid jet intradermal administration, preferably the Pigjet.

11. Portable bovine vaccination unit comprising an apparatus for liquid jet administration and a suitable vial comprising several doses of a vaccine formula according to any one of Claims 1 to 10, the apparatus for administration being designed to deliver a dose of vaccine formula intradermally.

12. Installation according to Claim 11, characterized in that the apparatus comprises a discharge head provided with 1 to 10 nozzles, especially 4 to 6, preferably 5 or 6.

13. Use of a plasmid combining a DNA sequence encoding a bovine immunogen and a promoter allowing the expression of this immunogen, for the preparation of a polynucleotide vaccine formula suitable for intradermal administration with an apparatus for liquid jet administration.

14. Use according to Claim 13, characterized in that it comprises between 10 ng and 1 mg of DNA, preferably between 100 ng and 500 μg, preferably between 0.5 μg and 50 μg, in a dose volume of between 0.1 and 0.9 ml, preferably between 0.2 and 0.6 ml, still more preferably between 0.4 and 0.5 ml.

15. Use according to Claim 12, characterized in that the DNA sequence encodes an immunogen of a pathogenic agent chosen from the group consisting of BRSV, IBR, BVD and PI 3 viruses.

ADD C3)